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ORNITHOLOGY IN INDIA

"Birds, companions more unknown
Live beside us, but alone;
Finding not, do all they can,
Passage from their souls to man.
Kindness we bestow, and praise,
Laud their plumage, greet their lays;
Still beneath the feather'd breast,
Stirs a history unexpress'd."—*Matthew Arnold.*

In May, 1922, my friend, Mr. Cedric Dover, wrote for this magazine a most interesting article entitled "Entomology in India." In that paper Mr. Dover gave a brief account of the study of insects in this country. There is no doubt that entomology is a fascinating study and that there are many students of the subject in India; but, as one interested in ornithology, I must necessarily hold a brief for the study of birds. Of all the vertebrates, birds are the most familiar creatures. The habits and colour of a large number of species are such that they compel notice. Consequently, birds are represented by the largest number of known species in India. It is said also that birds are in many ways the most interesting vertebrates. This is, of course, a matter of opinion. Every real student thinks his own branch of study the most interesting, and loves it; for if he did not, he would be a hypocrite and one who was not a real student. Personally, I think birds are of most interest.

The habits and colour of birds are to a large extent responsible for the great number who have enlisted themselves as students of ornithology. I include, of course, song as a habit. A bird of such villainous propensities as the Common House-Crow (*Corvus splendens splendens*), although it is incapable of producing sweet sounds and lacks fine feathers, is, nevertheless, a bird we all know; the Peacock (*Pavo*

cristatus) has become a familiar friend on account of his brilliant plumage; the Shama (*Kittocincla macroura tricolor*) is a favourite cage-bird because of its power of song. It is therefore not surprising to find that ornithology has attracted so much attention in India and elsewhere. At present we know a great deal more about birds than about some branches of zoology, *e.g.*, insects or reptiles. A vast amount of literature exists concerning birds. Years ago Blanford wrote: "There is probably no division of Indian biological science, not even Botany, on which so much has been written and of which our present knowledge is so far advanced." This statement perhaps holds good to-day, but even now there is much to be learnt. For instance, we do not know what purpose, if any, is served by those curious appendages called "casques" which are worn by the Hornbills (*Bucerotidae*). Why should not our Indian Hornbills be like the Toucans (*Rhamphastidae*) of America and have big bills without casques? We know very little of the plumage of nestlings—information which would be of help in ascertaining the affinities of different families of birds. Practically nothing is known of the roosting habits of birds in India; the economic aspect of Indian ornithology has been barely touched; and we know very little about the migration of birds in India.

Indian zoology in general has been so far studied that an official publication in several volumes has been compiled on the subject, namely, *The Fauna of British India*. Four volumes have been devoted to ornithology alone, which shows how much we know about Indian birds, especially when we consider that these volumes contain but very brief accounts of each species. For many years, *The Fauna of British India* has been standard work, and it is without doubt a most valuable production. The first two volumes on Birds were written in the years 1889 and 1890 by the late Mr. Eugene W. Oates, one of the best ornithologists then

living. The third and fourth volumes, however, were written in the years 1895 and 1898 by Dr. W. T. Blanford, as Oates was unable to complete the work during his period of furlough in England. Before the publication of the Bird volumes of *The Fauna of British India* series, the best known work on Indian birds was Dr. Jerdon's *Birds of India* (1862). This work, although of such great value, did not contain information about those species of birds which are found in Sind west of the Indus, the Western Punjab, Hazara, the Upper Indus Valley north and north-west of Kashmir, Assam, Burma and the intermediate districts, Ceylon, and the Andaman and Nicobar Islands. In the introduction to the first volume of *Birds of India*, Jerdon gave an account of the principal writers on Indian birds up to the year 1862. The following are the names of these contributors: Franklin, Tickell, Sykes, McClelland, Burgess, Adams, Tytler, Kelaart, Layard, Hutton, Hodgson and Blyth. To the two last named, and to Jerdon, we owe an eternal debt of gratitude, for these three workers laid the foundation-stone of ornithology in India. Since the appearance of Jerdon's famous work some of the best contributions to Indian ornithological literature are: (1) Blyth's commentary on Jerdon in *The Ibis*, 1866-67, his list of the birds of Burma, published with additions by Viscount Walden in *The Journal of the Asiatic Society of Bengal*, 1875; (2) Jerdon's supplementary notes in *The Ibis*, 1871-72; (3) papers in *The Ibis* and *The Proceedings of the Zoological Society* by Viscount Walden, Wardlaw Ramsay, Biddulph, Anderson, Elwes, Beavan, Scully and Sharpe; (4) papers by Stoliczka, Godwin Austen, Brooks, Ball, King, McMaster and Blanford in *The Journal of the Asiatic Society of Bengal*; (5) Hume's *Scrap-Book*, *Nests and Eggs of Indian Birds*, *Lahore to Yarkand* (in which he was assisted by Dr. Henderson), and *Game-Birds of India* (written in conjunction with Cols. C. H. T. and G. F. L. Marshall); (6) Legge's *Birds of Ceylon*, 1890,

Oate's *Birds of Burma*, J. Anderson's *Zoological Results of the Yunnan Expeditions*, 1878, Barnes's Birds of Bombay, Murray's *Vertebrate Zoology of Sind*, 1884, and *Avifauna of British India*, 1887-90; and (7) *Stray Feathers* in eleven volumes, 1873-1899. *Stray Feathers* is the somewhat eccentric title given by Hume to a journal containing notes on Indian birds from writers in all parts of the country. The major portion of this journal was written by Hume, but he was assisted by a large body of contributors. *Stray Feathers* is a valuable contribution to the literature on Indian birds and should be familiar to all students of ornithology in this country.

Let us now consider briefly the life-histories of some of the earlier Indian ornithologists.

Brian Houghton Hodgson was born in the year 1800. He joined the Civil Service and arrived in India in 1818. Two years later he was appointed Assistant Resident in Nepal, becoming Resident in 1833, and holding that post till 1844. During the first Afghan War Hodgson succeeded in keeping Nepal quiet, but he was hastily removed by Lord Ellenborough, and this caused Hodgson to resign the service. Hodgson's labours in Nepal are wellknown, and for much of the knowledge of the ornithology of that part of the country, and of Indian ornithology in general, we owe him a great debt of gratitude.

Another early Indian ornithologist of great fame is Edward Blyth, who was born in 1810. Blyth made natural history the absorbing study of his life. From his earliest days he studied the subject, and in 1841 he was appointed Curator of the Museum of the Asiatic Society of Bengal, on a small salary. He retired from this post in the year 1862, after having contributed a large number of reports and papers to almost every number of the Society's journal during the time he was working there. He also wrote to the newspapers and to the *Calcutta Review*.[1] Blyth's work was highly estimated

[1] This present *Calcutta Review* is in continuation.

by Darwin, and Blyth is said to have been the founder of zoology in India. He died in the year 1873. The following is an extract from Hume's obituary notice in *Stray Feathers*, Volume II :—

"It is impossible to over-rate the extent and importance of Blyth's many-sided labours. Starting in life without one single advantage, by sheer strength of will, ability, and industry, he achieved, and deservedly so, a reputation rarely surpassed, and better still did an amount of sterling work such as no labourer in this field has ever encompassed.

"Unshaken in his devotion to science, he toiled on, unrewarded, unappreciated, by men whom circumstances, not merit, placed above him as superiors, on a pittance barely sufficient to procure here the necessaries of life. Known in those days as one of the clearest-headed men in Calcutta, repeated efforts were made to induce him to devote his energies to business, and paths to what, at that time, was certain wealth were freely opened to him. But neither neglect nor harshness could drive, nor wealth, nor worldly advantages tempt him from what he deemed the nobler path. Ill paid, and subjected as he was to ceaseless humiliations, he felt that the position he held gave him opportunities for that work which was his mission, such as no other then could, and he clung to it with a single-hearted and unselfish constancy nothing short of heroic."

As far as their influence on the study of Indian ornithology is concerned, Jerdon and Hume stand in a class by themselves.

Thomas Claverhill Jerdon was born in the year 1811. He joined the medical service in Madras in 1835, working in that service till 1864, when he retired. Although a doctor by profession, Jerdon is better known as a zoologist. His most famous works on Indian zoology are his *Illustrations of Indian Ornithology*, 1844, *Birds of India*, 1862-4, and *Mammals of India*, 1867. His first two publications were standard works

on ornithology for many years, and even now they are frequently consulted. Prior to the publication of *Birds of India* no account of Indian birds was available. Therefore, Jerdon's work marked an epoch in the history of Indian ornithology.

Allan Octavian Hume was born in 1829. He entered the Bengal Civil Service in 1849, and after serving in various capacities, he became Secretary to the Government of India in the Department of Revenue and Agriculture. He appears to have been a man of peculiar temperament. For years he criticised the actions of Government, and he was a prominent organiser and supporter of the National Congress. Ornithology became a mania with him, and many curious stories are told of his devotion to the study of birds, which was stronger than his devotion to legitimate official duties! Hume is well-known among ornithologists on account of his many works on Indian birds and his vast collection of skins, nests and eggs. Being a man of exceptional ability and brain-power he was not free from that eccentricity which sometimes accompanies genius. Mr. Edward J. Buck, in his *Simla Past and Present*, gives a very interesting account of Hume, in the course of which he says :—

"Mr. Hume was essentially a man of hobbies, and whatever hobby he took up was ridden well and hard. At the time he was brought to Simla the special subject to which he had been devoting his energies was that of ornithology. Possessed of ample private means, he had in his employ an army of collectors, some of them Europeans working on liberal salaries even beyond the limits of India proper, while many private collectors, falling under the influence of Mr. Hume's genius, gave him strenuous assistance in all parts of the Indian Empire. Many birds new to science were discovered by himself or by his agents. The specimens were all brought to "Rothney Castle"[1] and arranged

[1] "Rothney Castle" is one of the largest buildings in Simla. It is situated on Jakko Hill. In Hume's time the building was perhaps the largest in Simla.

there in classified order in cabinets which lined the walls of the room utilized as a museum. The collections were rapidly augmenting when suddenly Mr. Hume mounted another hobby. This time it was Theosophy! And one of the tenets of that creed being to take no life, telegrams were sent to the collectors to stop work and shoot no more birds, while at the same time an offer was made to the authorities of the British Museum to present the entire collection to that institution on condition that they would send out an expert to overhaul the specimens at 'Rothney Castle.' The offer was naturally accepted; Mr. Sharpe, one of the staff, was sent to Simla and the collection removed to the British, and then the South Kensington Museum, where it forms one of the most valuable assets.

"Mr. Hume was undoubtedly led to the worship of Theosophy by the High Priestess of that cult, Madame Blavatzky, at whose disposal the hospitality of 'Rothney Castle' was always placed."

William Thomas Blanford was born in 1832. He served in the Geological Survey of India from 1855-1882, and earned a great reputation as a geologist. He published valuable works on the geology and zoology of Abyssinia and Persia. He is known also as a famous zoologist, for he was the Editor of *The Fauna of British India* series, and was the author of the volumes dealing with the *Mammalia*, 1888-1891, and of two of the volumes on Birds.

Next we come to Eugene William Oates. He was born in the year 1845, and was an officer in the Public Works Department in Burma for 32 years, from 1867-1899, and reached a high position in that service. Oates will always be remembered by those who are students of Indian ornithology, for not only did Oates add materially to our knowledge of the birds of this country, but he was also a capable man with a facile pen. His first well known work was *A Handbook of the Birds of British Burma*. His other works include an edition of

Hume's Nests and Eggs of Indian Birds, a *Manual of the Game Birds of India*, the first and second volumes of the *Catalogue of the Collections of Birds' Eggs in the British Museum*, and the third and fourth volumes of the same work in which he was joint author with Captain Savile and Mr. G. Reid. He wrote also the first two volumes on Birds in *The Fauna of British India*. Oates was a careful and accurate field-observer as well. He accumulated a fine collection of Burmese birds and eggs which now forms part of the National Collection. His last years were devoted to the study of the Kalij and Silver Pheasants, and his collection of these birds is another valuable acquisition to the British Museum. There is an amusing story about Oates and the second volume of Birds in *The Fauna of British India*. In this volume, on page 290, we find that the Streak-eyed Wagtail is stated to have a note which has been described as "a prolonged Pooh." This startling statement has often baffled Indian ornithologists, as no wagtail emits a note which sounds anything like "Pooh"! The explanation of this remarkable statement is known to few. These are the facts. Oates was in the midst of his MS., which was lying on a table in the Natural History Museum in England, when Mr. Ogilvie Grant and Dr. Sharpe, who were passing by on their way to lunch, saw it. Dr. Sharpe wished to play a practical joke, so he said, "Let us add something funny to Oates' description of this wagtail," and accordingly he made the streak-eyed wagtail utter an impossible note—a mistake which was not detected and which therefore appeared when the book was finally printed!

In *Stray Feathers* and *Nests and Eggs of Indian Birds*, many ornithologists are mentioned. Although they did not establish reputations such as those held by Hodgson, Blyth, Jerdon, Hume, Blanford or Oates, yet those workers contributed much to our knowledge of Indian birds. They were scattered over different parts of India and were able to

furnish much information relating to their districts. The statement below gives the names of a few of these ornithologists and the places about which they wrote.

Davison	...	Andaman and Nicobar Islands.
Legge and Parker	...	Ceylon.
Bourdillon	...	Travancore.
Miss Cockburn	...	Nilgiris.
Col. Butler	...	Belgaum.
Davidson & Wenden	...	Deccan.
Doig ...	...	Sind.
Major Bingham	...	Delhi and Allahabad.
Reid ...	...	United Provinces.
Capt. Hutton	...	Dehra Dun.
Thompson ...	...	Kumaon and Central Provinces.
Littledale ...	...	Baroda.
Gammie and Mandelli	...	Sikkim.
Cripps ...	...	Bengal and Assam.
Wardlaw Ramsay	...	Afghanistan and Burma.

Notwithstanding all these contributions, and the work done by so many in days gone by, the efforts of modern ornithologists in India have still further advanced our knowledge of birds. A large mass of ornithological literature lies scattered about in such publications as *The Ibis*, *The Bulletin of the Ornithologist's Club*, *The Journal of the Bombay Natural History Society*, *The Journal of the Asiatic Society of Bengal*, *The Avicultural Magazine*, etc. At the present day the foremost society for the study of ornithology in India is the Bombay Natural History Society. Since the foundation of this society in the year 1883, the study of all branches of Indian zoology has, to a greater or lesser extent, been stimulated. Without doubt our knowledge of birds has increased to a very appreciable extent. The growing popularity of the Bombay Natural History Society

is shown from the fact that in 1883 it originally consisted of eight residents of Bombay, whereas there are now about 1,500 members. This is the only society of its kind in India and its quarterly Journal "is recognised to-day as the best periodical in India for the publication of short notes on Natural History, and for papers both scientific and popular on subjects likely to be of interest to the amateur naturalist and sportsman. Even to those who are professional scientists it is of great value." Short notes on the habits and distribution of birds have been contributed to the Society's journal by writers in various districts, a large number of lists have been compiled of birds found in particular localities, and long papers on Indian birds have been written. These contributions have consequently resulted in our greater knowledge of the birds of this country within recent years.

Among modern Indian ornithologists the most noteworthy is Mr. E. C. Stuart Baker. Mr. Stuart Baker was a Government official in India for many years and he has therefore been able to help with first-hand knowledge of birds which he has seen and studied for years. Hume and Marshall's *Game-Birds* was for a very long time the leading work on the subject. This valuable work is now being replaced by a still superior work by Mr. Stuart Baker entitled *The Game Birds of India, Burma and Ceylon.* It will consist of four volumes, dealing separately with Indian Ducks and their Allies; Snipe, Bustards and Sand-Grouse; Partridges; and Pheasants. The first two volumes have already been published, and before long Indian ornithologists and sportsmen will be able to purchase the two remaining volumes. Like Hume and Marshall's work, however, Stuart Baker's volumes on Game Birds are very expensive. This cannot be helped on account of the numerous coloured plates which have increased the cost of production, which, in turn, must be met by a correspondingly high sale-price. But Stuart Baker's fame as an Indian ornithologist was established before he wrote *Game-Birds.* His valuable

contributions to *The Journal of the Bombay Natural History* (and other publications), such as his paper on the Birds of the Cachar District, have advanced the study of bird-life in India to no little extent. Another well-known authority on Indian birds, especially on waterfowl, is Mr. Frank Finn, who was at one time Deputy Superintendent of the Indian Museum at Calcutta. Finn has written several books, such as *The Game Birds of India and Asia*, *The Waterfowl of India and Asia*, *Indian Sporting Birds*, *How to Know the Indian Waders*, *Garden and Aviary Birds*, *The Birds of Calcutta* and *Ornithological and Other Oddities*. Finn's books have been expressly written for the use of the layman who is interested in ornithology, and I can recommend all these books to those who would like to know the habits of our feathered friends. As a contemporary of Finn we have another writer of "popular" books on Indian ornithology. I refer to Mr. Douglas Dewar, I.C.S., who has written several most interesting books, for instance, *Indian Birds*, *Glimpses of Indian Birds*, *A Bird Calendar for Northern India*, *Birds of the Plains*, *Birds of the Indian Hills*. I may mention a most fascinating book, written jointly by Messrs. Finn and Dewar, entitled *The Making of Species*. There are many interesting topics on Indian birds dealt with in this book. The name of the late Mr. E. H. Aitken will live for generations on account of his brilliant and amusing books. There are but four, but who has been able to write such books since? I strongly advise all who have not yet had the pleasure of doing so to read these four books: *The Tribes on My Frontier*, *Behind the Bungalow*, *A Naturalist on the Prowl*, and *The Birds of Bombay*. *Behind the Bangalow*, does not deal with Natural History, but I have mentioned this book for the sake of completeness.

Blanford in his Preface to the first volume on Birds in *The Fauna of British India* series wrote: "Hitherto the progress of Indian ornithology may be divided into two periods: the first of which, ending with the publication of

Jerdon's work, was specially signalized by the labours of Hodgson and Blyth, whilst in the more recent period the dominant figure has been Mr. Hume." From our present knowledge of the subject we are now in a position to mark two more periods, namely, the period of Blanford and Oates, and the present time, with Mr. Stuart Baker as the leading Indian ornithologist. But the two greatest Indian ornithologists are Jerdon and Hume. Great as has been our advancement in the study of birds, the vast amount of information collected by these two men remain inexhaustible mines. No one, not even Mr. Stuart Baker, can write about Indian birds without having to fall back on Jerdon or Hume or both for some information. In the old days such workers as Hodgson and the Marquis of Tweeddale (Viscount Walden, already referred to) made good collections of bird-skins, etc., but Hume's energies were so great that it is said that his collection of bird-skins, nests and eggs is far superior to any that has ever been made from a similar area and in a similar period. Some idea of this grand collection, which is now in the British Museum, may be gained when it is stated that Hume presented the Museum with about 60,000 skins, in addition to a very large number of nests and eggs. The Hume Collection was made in about ten years' time, from 1872 to 1882.

Before leaving the work done by Indian ornithologists we should consider the crowning achievement of Mr. Stuart Baker. Not long ago official sanction was accorded to the publication of a second edition of the Bird volumes of the *The Fauna of British India*, and Stuart Baker was selected as the best man for this task. Students of bird-life are delighted at the selection made. The first volume of the second edition has just been published. It is proposed that a volume should be brought out every two years until the Bird volumes have been completed, on the understanding that sufficient funds are available for this purpose. It is to be hoped that enough money will be forthcoming, because once the second edition

is completed we ought to have an almost up-to-date authoritative work on the birds of India. Besides taking into consideration the fact that the second edition of the Bird volumes of *The Fauna of British India* will contain fairly up-to-date information, other improvements have also been made. I cannot attempt a review of the first volume, but some points deserve mention. To begin with the scientific nomenclature has been revised in the light of recent investigations and the trinomial system has been employed. I shall not go into the reasons why the trinomial system has been used, but suffice it to say that it has great advantages over the old system which consisted of a generic and a specific name. One *disadvantage* of the trinominal system is that if it is not properly employed there is a tendency to create new sub-species on insufficient data—a pitfall which it is most difficult to avoid at times. Another improvement in the new edition of the Bird volumes is the fuller information given on the nidification and general habits of birds, which are of much value to the observer in the field. The addition of coloured plates, painted by Stuart Baker himself, also enhance the value of the new edition.

It will thus be seen that the popularity of ornithology, as evinced by the number of workers on the subject and the amount of literature that has been published thereon, is quite obvious. We have seen that there appear to be two main schools of Indian ornithologists. The one studies bird-life from a scientific point of view, that is to say, the workers of this school publish information mainly for the use of the scientist and advanced student, they make large collections of skins, nests and eggs, which usually find resting-places in museums. To this school belong Hodgson, Blyth, Hume, Blanford, Oates and Stuart Baker. The other school is what may be termed the "Popular School," and those who belong to it make observations and publish literature primarily for the sake of interesting the layman. The fact that "popular"

books on birds have a better market value among the general public than scientific works has perhaps been largely responsible for the establishment of this school. The leader of the present popular school of Indian ornithology is Mr. Douglas Dewar. There is no question but that his books are full of interest, and he shows in each page the result of his own personal observations which are of no mean order. Be that as it may, there are two features in Dewar's books which somewhat detract from their value. One is the very antagonistic attitude adopted towards the cabinet ornithologist and systematist. Dewar is always poking fun at scientific nomenclature, for instance, he refuses to march with the times, preferring rather to follow the older scientific names and classification. The other feature which mars his books is his patent superficiality in describing the habits of some birds. Take, for instance, his chapter on the Black and Yellow Grosbeak (*Perissospiza icteroides icteroides*) in *Birds of the Indian Hills*. We are told hardly anything about the habits of this remarkable finch, most of the chapter being devoted to a comparison between the resemblance in outward appearance of the Black and Yellow and Grosbeak and the Indian Black-headed Oriole (*Oriolus luteolus luteolus*). There are some who think that Dewar would have done better had he devoted his attention to the study of birds from a purely cut-and-dried scientific aspect. Mr. Frank Finn has also done much to encourage the layman in the study of Indian bird life, as has been mentioned already. Finn's books are also of value to the aviculturist, and there are many who are fond of keeping birds in captivity. The inimitable EHA was also a popular writer on Indian birds, and the extraordinary manner in which he was able to pick on some peculiar characteristic of a bird, and by this characteristic alone help the man in the street to recognise the bird, is a gift which EHA alone possesses. It is due to writers like EHA, Finn and Dewar that the ordinary individual, who has a liking for birds and a

tendency for the study of natural history, becomes a student of ornithology. He, who is not a professional scientist or an amateur not obsessed with a mania for ornithology, does not like to study ornithology from technical books. He likes birds and observes their characteristics, and has perhaps gained much first-hand knowledge by observing birds in their wild state and in a state of captivity. If a book written by any of the popular writers was put into the hands of such a man, the probability is that he would soon interest himself in birds to a greater extent than he had done before, for the simple reason that he understands what he is reading. On the other hand, if such a man was given a technical book, and by a reference to this work tried to identify a bird from difficult scientific keys and dull colourless descriptions, the chances are that he would not be able to find the bird he was looking for, and what is more, he would perhaps throw the book aside, and continue calling, let us say, a Treepie a "Long-tailed Jay." Not long ago I had a personal experience of a typical case of this nature. The incident took place at Delhi, where a sportsman who was a beginner one day shot a duck. On previous occasions he had shot game birds which he could not identify, and he therefore thought that he would invest in "a good book" on game birds. He did not want to spend very much on the purchase of the book and therefore did not buy Hume and Marshall's *Game Birds* or Stuart Baker's *Indian Ducks and their Allies*. Instead he consulted a bookseller's catalogue and eventually bought a copy of Le Mesurier's *Game, Shore and Water Birds*. Now, in buying this book he made a great mistake, for this was not at all the kind of book he wanted. However, he bought Le Mesurier's *Game, Shore and Water Birds*, and with the aid of this book he set to work to identify the duck he had shot. After a great deal of fruitless search he gave up the task and came to me for advice. As it turned out the duck he had bagged was a very common species, although it was unfamiliar to the person

who had shot it, and an oral description was enough to enable me to guess that the bird was a male Wigeon (*Mareca penelope*), which identification I found was correct when I saw the dead bird. My friend complained that the book did not help him, and it was no wonder. I showed him a copy of Finn's *Water-fowl of India and Asia*, in which a good description of the colour and habits of this duck is given. Finn's popular little book cost much less than the other book and also contained the information required. I am glad to say that this unfortunate sportsman bought Finn's book, and what is more, he can now follow better the descriptions given in technical works. Except the individual who has made science his profession or the advanced amateur naturalist, long scientific names frighten people! To most average sportsmen in India "*Anas pœcilorhyncha pœcilorhyncha*" conveys no meaning, but they know at once what is meant if they see the words "The Spotted-billed Duck,"—a bird which they know is worth shooting and eating. I have heard it said that Latin names are used to drive off the man in the street, and to keep a particular branch of natural history a sort of preserve for the delectation of the professional man and the advanced amateur who is persevering and painstaking enough to master these Latin names! So the popular book is, I maintain, of use, in so far that it is the means of turning those with a tendency towards the study of birds into men who will soon know more of bird-life, and perhaps, into ornithologists of real repute. Popular books are often the stepping-stones that lead one to understand technical works.

There are many hundreds of species of birds in India, Burma and Ceylon, and wherever we may happen to be living, certain birds force themselves on our attention. Even in our garden and in the immediate precincts of the bungalow many kinds of birds are to be seen daily which we cannot help but notice. The crow, the kite, the sparrow and the myna, are, like the poor, always with us; the hoopoes and doves walk

daintily on the green lawn; the tailor-birds and other warblers frequent the bushes in the garden and gladden our hearts with their song; the oriole's fluty voice is heard in the mango-tope; the "Seven Sisters" murmur and chatter and shout throughout the day; that nasty little hawk, the shikra, dashes after a small bird in full view of us all; the king-crow watches, and soon after he imitates the dreaded, disyllabic note of the hawk, laughing to himself as he sees the other birds instantly darting for the nearest cover; the dhyal and the shama, hanging in their cages, pour forth pleasing lays; out in the fields the green paroquets destroy the crops and distract the *raiyat;* the red-wattled lapwing runs along the ploughed ground, and flying off on black and white pinions, shouts "Did you do it ?"; the swift teal dashes down on to the *jheel*; the pond-heron suddenly appears from nowhere from the side of a shady pool; the ventriloquial hoot of a crow-pheasant resounds from the depths of some tangled undergrowth; and the owls and nightjars break the stillness of the night with their weird calls. These birds, which we all know, are but small portion of the avifauna of India. Bird-watching is one of the most enjoyable pastimes that can be imagined. It has also the advantage that it combines pleasure with study in a most inexplicable and unavoidable manner. There is always something to be learnt by watching our feathered friends. For example, our ignorance as to the roosting habits of birds is abysmal. We see scores of birds of various species during the day, but as soon as darkness falls all these birds disappear mysteriously. Where do they go, and how do they roost ?

We cannot watch birds without learning something of their nesting habits. We see a great diversity in the kinds of nests built, the materials of which these are constructed, and the sites selected for their construction. We find that some birds do not make any nest at all, but simply lay their eggs on the bare ground, *e. g.*, the plovers and terns; some, like

the barbets and wood-peckers, lay their eggs in holes made in trees; others construct elaborate nests, like the tailor-bird and the weaver-bird; swallows make retort-shaped nests entirely of mud; the common swift makes a saucer-shaped nest of feathers glued together by a salivary secretion; the vultures make large platforms on high trees; and the dabchick constructs a floating nest on the water. We find a great variation in the size, colour and shape of the eggs laid by Indian birds. We have the huge egg of the lämmergeyer of the hills and the tiny eggs of the munia of the plains; the white eggs of the owl and the beautiful eggs of the Indian wren-warbler; the ordinary oval-shaped eggs, the "polished alabaster balls" laid by the bee-eaters, the pegtop-shaped eggs laid by the jaçanas, and the curious blunted eggs of the sand-grouse. The best known work on Indian öology is Hume's *Nests and Eggs of Indian Birds*, edited by Oates. Although written many years ago it contains splendid accounts of the nidification of a large number of birds, and the information would have been more complete had it not been that Hume's servant one day broke into his master's museum and sold as waste paper a considerable number of notes! *Birds' Nesting in India* by Col. G. F. L. Marshall (1877) is another useful book, as it contains much information put together in a concise form. But the most up-to-date information will be found in the new edition of the Bird volumes of *The Fauna of British India.*

The eggs of birds are of use in establishing the affinities of one family with another, as we see that the rollers, bee-eaters and kingfishers all lay similar eggs and are related. More attention is now being paid to the plumage of nestlings; skins of nestlings and young birds "are still desiderata in the British Museum and other institutions." A recent appeal has been made in *The Journal of the Bombay Natural History Society* for the skins of nestlings, and it is to be hoped that members of the society will respond willingly and so help in

accumulating data which will elucidate many knotty problems in regard to placing various Indian birds in a systematic order showing their relationship. It is said that no branch of ornithology has remained so long neglected, nor is there one in which the solution of so many problems is awaited. There is, consequently, hardly any literature on the subject, and the little we have lies scattered about in scientific publications which are not accessible to the average individual. Those who are interested in the subject are referred to an excellent paper entitled "A Contribution to the Study of Nestling Birds" by Collingwood Ingram in *The Ibis*. Though brief, this paper contains a great deal of valuable information, and serves as an introduction to the fascinating study of the plumage of nestling birds. As Mr. Collingwood Ingram himself says, his paper is "offered chiefly with the idea of stimulating further research."

The keeping of birds in captivity is nothing new. In India there are numbers of birds of various species which are kept as pets. Everyone in India has seen the Common Ringed-necked Paroquet (*Psittacula torquata*), or Green Parrot as it is usually called, as a captive. Numbers of young parrots are sold in the bazaars, huddled together in big baskets. Dhyals, shamas and bulbuls are well-known cage-birds in this country, and so also are partridges and quails. A visit to Tiretta Bazaar in Calcutta will show that there is a prolific trade in captive birds. From personal experience I know that there is a class of professional bird-catchers in Calcutta, as there is also a class who sell as a profession insects and other food for cage-birds. I have spent many a happy day in the outskirts of the city in the company of an old bird-catcher with his jointed bamboo rods, his *lhasa* [1] and his gunny bag wherein he stores his captures. Many years ago there was in Entally a famous dealer in wild animals of all

[1] Bird-lime.

kinds. This gentleman, the late Mr. Rutledge, often had some rare and beautiful birds in his private zoo. Mr. E. W. Harper is another well-known dealer. He has been responsible for sending to the London Zoo some most interesting specimens of birds. There are also others who take a keen interest in aviculture, and among these I may mention my friend, Mr. Satya Churn Law of Calcutta, who has a very fine collection of captive birds of various kinds in his aviaries. For the paragraphs which follow on aviculture in India, I am indebted to Mr. Law for having so willingly supplied me with information on this branch of ornithology, of which he has a splendid knowledge, both theoretical and practical.

(*To be continued*)

S. BASIL-EDWARDES

Basil-Edwardes, S. (1924). Ornithology in India. II. The Calcutta Review. 14:378-384.

ORNITHOLOGY IN INDIA

II

The practice of keeping birds in captivity in India dates back to very ancient times. The Vedic literature of the Hindus contains many references to several *talking* birds, like the Mynas and the Parrots, which were regarded as common favourites in those days. Even the women-folk treated them as indispensable companions. Allusion is also found in some Vedic books (*vide* Mr. Law's book entitled *Pakhir-Katha*, pp. 5-9) to some albino or lutino specimens of the species mentioned above, which were sacrificed at the altars of particular deities. Pigeons were regarded as household birds of good omen. Authentic testimony which history furnishes to the Indian custom of caging Parrots is traceable to the time of the invasion of India by Alexander the Great. This Emperor took back with him, when he returned to Greece after his success, a number of Ring-necked Parrots which are known to this day as "Alexandrine" Paroquets. The historian Ælian tells us that "In India there were many parrots which were held sacred by the Brahmans, because they could imitate human speech, and which were therefore neither killed nor captured by the Indians." This statement, however, is not wholly true, because the talking propensity of the bird was discovered in its state of captivity, and as a matter of fact, there is no sentiment among the people against the practice of caging that bird. In the latter part of the 15th century A. D. these Indian Parrots were freely exported to Europe by the Portuguese, who had discovered the Cape route to India, and possessed themselves of a great part of India and Ceylon. The Muhammadan Emperors of India were very fond of cage-birds. Several of them were addicted to hawking, and therefore made elaborate arrangements for

housing several kinds of Hawks. The Hindu Kings were not free from this hobby either, and one of them was so zealous that he made a systematic study of the subject, and wrote a book on hawking, in which not only the habits and qualities of several species of falcons in reference to hawking were set forth, but also the ways and means by which they may be caught, tamed, trained and best housed were dealt with. Akbar took a great interest in bird-keeping. He had several aviaries and a vast number of Pigeons. The first attempt at cross-hybridization in India is probably that of Akbar, who succeeded in raising the "Fantail" Pigeon, so widely appreciated now-a-days by pigeon-fanciers (*vide* Darwin's *Animals and Plants under Domestication*). Sanskrit literature is full of references to the practice of bird-keeping, which struck its roots so far and wide among the people of India, that we find no diminution of the popular ardour even at the present day. Birds are kept in India not only for their song or talking propensities—their sporting or fighting merits are also appreciated. Partridges, Quails and game-cocks comprise the favourite fighters. The Bulbul is another fighting bird. A season is set apart every year for indulging in this hobby, and the professional bird-catchers make it a point of snaring bulbuls at the fighting-season. Even so small a bird as the Common Avadavat or Indian Red Munia (*Amandava amandava amandava*) is trained to fight.

The long-established habit of caging birds has developed into a tradition which is hedged round with a halo of sanctity. The method followed in providing accommodation and food for cage-birds is in conformity with this tradition, so that the Indian bird-fancier never dreams of attempting innovations. Small wicker cages are invariably provided with a linen cover, and the staple food is *satoo*,[2] which is either fried in *ghee*,[3] or soaked in water to form a paste. Grains, fruits, insects

[1] Bird-lime. [2] Ground-meal.
[3] Clarified butter.

and meat are also provided, to suit the nature of the birds which are sought to be caged. The bird-keepers in India are, of course, ignorant of European methods of keeping pets, but tradition leads them to follow the methods which have been found suitable to achieve the ends they have in view. The Indian birds also adapt themselves in a remarkable degree to the new environments in which they are placed, and, it is said, their faculties show to best advantage in captivity.

Aviculture, as we understand it, is only a later phase of bird-keeping. This word was first coined and used by the founders of the Avicultural Society of London in the latter part of the 19th century. The object of this Society is to encourage birds to breed in captivity, and, while thus circumstanced (*i.e.*, in a congenial place wherefrom all hostile elements are eliminated), to study their habits and other biological or ornithological phenomena with a view to adding to our knowledge of bird-life. Foreign birds are sought to be freely imported and studied in captivity. Before this Society propounded its scheme, bird-keeping in Europe followed an artificial standard which precluded the scientific study of the habits of birds. It was rightly designated "fancy," and the "fanciers," while bent on mule-breeding, sought, for example, to develop uniformity of colour-marks in a bird's plumage. Canary and mule-breeding were the principal features of this "fancy." The aim of "fancy" was the breeding and exhibition of specimens which would, as closely as possible, conform to some artificial type. Aviculture, on the other hand, is one method of the practical application of the science of ornithology; indeed, Mr. Law thinks that aviculture may well be called "Applied Ornithology." Aviculture includes in its province the acclimatization and breeding of imported species, and the study of the habits of all species, local or foreign, especially in a state more or less under the dominion of man. Most ornithologists in the past were ignorant of the avicultural branch of their science, and

it is the Avicultural Society of England that has done much to remove this ignorance. How far the society has been successful in its object, may be gathered from the fact that in the International Congress of Ornithology, held in Paris in the year 1900, a section was reserved for Aviculture.

The study of bird-life in Nature is beset with difficulties and is full of obstacles, and although the work of Indian ornithologists is highly creditable, yet much remains to be known regarding the habits and activities of many of our birds. Mr. Law says: "If we have to depend entirely on the field ornithologist for our knowledge of the whole truth about bird-life, we shall have to wait long, and in many cases, wait in vain. The field observers cannot observe one particular bird the whole year through, but gleans facts from chance acquaintances, and he might deduce conclusions that might be altogether different from the actuality. The aviculturist, on the other hand, gets an opportunity to study a bird for years, and if he studies it from an ornithological viewpoint, he is likely to get at many of the truths affecting 'the synonymy, the nidification, the courting, the tendency to polygamy or polyandry, the duration of incubation and the sexual characters of birds, etc.' which are of the greatest scientific interest, even to a systematist. The more species that can be bred and studied in captivity, the better will the systematic student be equipped for comprehending the meaning of the various measurements in his cabinet specimens. The system of careful measurement, the study of plumage, etc., help much in classification, but there is a danger of the laboratory student straying into the wrong track. For example, we know that nestling birds have a wide gape, the breadth of the bill narrowing with age. This narrowing process does not end before the first moult, when many birds acquire adult plumage; nor do they at the time attain their full length. Now, when newly moulted youngsters are shot down by a field-naturalist in one part of the country, and

compared by the museum worker with adult specimens of the same bird shot in another part of the country, there is the danger of the younger bird being classified as a distinct sub-species, on account of the shorter bill and smaller size. Such pitfalls may be avoided by the aviculturist who gets an opportunity to study birds from birth to full maturity."

There is no doubt, however, that the aviculturist has done much to ameliorate the conditions of birds in captivity. Prior to the rise of a school of aviculturists the lot of birds was most miserable, and they received inconceivably cruel treatment at the hands of dealers. By his persistent outcry against such treatment, the aviculturist has compelled dealers and keepers to provide better food and accommodation for their *protégés*. In the next place the craze for "ospreys" by the gentler (!) sex in civilised countries led to the indescribable torture of many species of birds, and even threatened the extermination of some. The aviculturist has been able to put a stop to some of these cruel practices. Egret-farming has come into being in some parts of India. This is referred to later on.

It is, of course, true that the aviculturist is liable to make mistakes, but it is also possible to check the many very interesting hints gleaned by him by the study of birds in their natural state. Besides, it is certainly true that "the study of captive birds is a useful stimulus to field observers" to take up the matter and probe further into the mysteries of Nature. Aviculture may, therefore, also be regarded as the handmaid of ornithology, for both field observations and aviculture are very much inter-dependent on each other.

In India, aviculture was never in vogue among Indians. They have never attempted to move out of the groove marked out for them by tradition, and are content to establish the closest familiarity with their pets. The latter are invariably hand-reared nestlings, which are kept singly, no attempt being ever made to keep pairs and encourage them to breed. Occasionally, however, birds are to be seen in a state of

semi-domestication on the lawns of rich persons, but these birds are kept more for the sake of adornment than for any scientific purpose; and the birds are generally large ones, like cranes, storks and peafowl. Aviculturai study with Indian and other foreign birds was first systematically taken up by those English scientists who created a school of aviculturists in England. The most prominent names among them are those of Russ, Butler, Reginald Phillips, Astley and Teschemaker. The records of their observations on captive birds have materially increased our knowledge about them.

Mr. Frank Finn was the first person to attempt to induce captive specimens to breed in the Calcutta Zoo; but his work was not carried on by his successors, who apparently were content to keep their birds alive for show purposes as long as they could, and did not think it worth while to study their habits. Sporadic attempts at scientific caging and breeding of Indian birds are, however, on record, but they are generally made by an over-zealous person, imbued with the modern cult of aviculture. The British rule in India has facilitated the bird-trade of India to such an extent that most of the Indian cage-birds are now freely sent to Europe and Great Britain, where specially, much scientific study has been made with them.

No comprehensive literature on Indian cage-birds is available. Finn's *Garden and Aviary Birds* and Butler's *Foreign Birds for Cage and Aviary* are the only available and trustworthy volumes on the subject. There is an interesting paper by Finn on "Cage Birds of Calcutta" published in *The Ibis*, the journal of the British Ornithologists' Union, and reproduced in Vol. XIV of *The Journal of the Bombay Natural History Society*. Much important information is also strewn over the pages of the *Avicultural Magazine*, which if collected togeher, will greatly benefit future aviculturists who deal with Indian birds. Modern Indian literature is totally barren in this respect. The only book, which has scientifically

treated the subjects of aviculture and bird-caging, is written by Mr. Law in Bengali and is called *Pakhir-Katha* or "Bird-lore." Mr. Law is the first and only Indian known to me who has made an attempt to study aviculture from a scientific standpoint. He has also begun an interesting series styled *Pet Birds of Bengal* in which he has divided cage-birds into song-birds, talking birds, fighting-birds and miscellaneous birds kept for show, etc.

As far as we know at present there are no birds in India which are responsible for the dissemination of dangerous and fatal maladies, as in the case of some insects, like the mosquito and the flea. On the other hand, India possesses a large number of birds beneficial to man. As I have said before, we do not know very much of the economic value of birds in India—we have only been able to touch on the fringe of the subject. Turning now to Economic Ornithology, we find that birds may be considered economically in two quite different aspects: in the first place, from the direct point of view of the economic products of the birds themselves; and, in the second place, from the indirect point of view of the destruction by birds of insects which are injurious to agriculture.

As regards the economic value of birds from the point of view of their utility to man on account of the economic products of the birds themselves, we know that birds are of value for two main reasons:

(*a*) for the sale of their skins and feathers; and

(*b*) for eating purposes.

Most people know that the birds most commonly killed for the sake of their skins and feathers are the Egrets. Besides the Egrets there are also other species shot or otherwise killed for the market value of their feathers, *e. g.*, the Pheasants, principally the Monal Pheasant (*Lophophorus impejanus*) and the Crimson Horned Pheasants (*Ceriornis satyra* and *Tragopan melanocephala*), the Paroquets of the genus *Psittacula*, the Roller or "Blue Jay" (*Coracias benghalensis benghalensis*),

the Pied and White-breasted Kingfishers (*Ceryle rudis leucomelanura* and *Halcyon smyrnensis fusca*), especially the latter, of which species I once saw many thousands of skins for sale in a big street in Calcutta, and the Jungle-Fowls—the hackles of the Grey Jungle-Fowl (*Gallus sonneratti*) being utilised for the making of fishing flies. A large trade is carried on in the feathers of the Egrets. Several species of Egrets are killed annually when the birds are breeding because of the filmy feathers that grow on the backs of these birds during the breeding season. A great deal has been written on the subject of the trade in Egret feathers, the keeping of these birds in regular farms, and the advisability of legislation in connection with the trade. The exigencies of space prevent me from discussing the question in detail and the matter can only be considered very briefly.

It is now an established fact that, in parts of Sind at any rate, a fairly extensive trade is carried on in Egret feathers. There are many farms where the birds are bred for the purpose. In some farms the method of plume-plucking may be cruelly done, but this is not the case in every farm. If properly regulated Egret-farms were established, and the export of feathers permitted by license, a flourishing trade could be brought about, and there is every reason to think that with good management Egret-farming in India would be as humane and comparatively as profitable as ostrich-farming in Africa. The principal Egrets from which feathers are taken are the White Egrets, *viz.*, the Large Egret (*Egretta alba modesta*), the Smaller Egret (*E. intermedia intermedia*) and the Little Egret (*E. garzetta garzetta*); but the Cattle-Egret (*Buōulcus ibis coromandus*) and the Pond-Heron (*Ardeola grayii*) are also utilised.

I have not been able to obtain detailed statistics showing the export from India of the feathers of various birds and the market value of the feathers of these species, but I sub-join a brief statement of a general character. These figures

represent the registered legal trade in feathers, but a fairly extensive trade of an illegal nature is carried on at the more important Indian ports. It is, of course, impossible to obtain statistics of this unregistered trade.

Statement showing Export of Birds' Feathers.[1]

Countries of final destination.	Quantity in Lbs.			Value in Rupees.		
	1919-20	1920-21	1921-22	1919-20	1920-21	1921-22
United Kin dom	...	118	334	...	1,530	3,915
Perim	...	23	74	...	1,035	3,655
Other British Possessions ...	28	...	...	495	...	...
Egypt	..	230	205	...	4,350	6,000
Zanzibar, etc.	...	...	...	...	...	...
Total, British Empire ...	28	371	613	495	6,915	13,570
D'jibouti and Obok	...	...	...	...	...	...
France	...	...	...	...	...	...
Mossawah	...	...	...	...	...	...
North Africa, etc.	...	...	...	...	...	...
Other Foreign Countries ...	23	4	11	480	225	85
Total, Foreign Countries ...	23	4	11	480	225	85
Total, British Empire and Foreign Countries	51	375	624	975	7,170	13,635

The birds principally used for food are the Game Birds which include Ducks, Geese, Cranes, Snipe, Bustards, Grouse, Pigeons, Partridges, Quails, Pheasants, Jungle-Fowl and Peafowl. But in a country such as India, where a large percentage of the population is vegetarian, the number of birds killed for food is comparatively small. Other birds,

[1] *Vide* Annual Statement of the Sea Borne Trade in British India with the British Empire and Foreign Countries for the fiscal year ending 31st March, 1922, Volume II.

which are not strictly regarded as game birds are also shot and eaten, but the number of these is so small that we need not consider them.

As regards the economic value of birds from the point of view of the destruction by birds of insects harmful to agriculture, the only useful literature we have on the question is a Memoir of the Imperial Department of Agriculture in India, entitled "The Food of Birds in India." Thanks to the late Mr. C. W. Mason, a series of useful experiments and research work was carried out at Pusa, where specimens of various species of birds were shot with a view to ascertaining, by an examination of their stomach-contents, which birds were beneficial or otherwise to agriculture because of the kind of food eaten by them. The results of Mr. Mason's work give at least some indication of the economic importance of birds in relation to agriculture. It was thought that birds examined at a place like Pusa, in the heart of an agricultural district, would prove useful. Due to lack of sufficient material no far-reaching conclusions could be arrived at. Mr. Maxwell-Lefroy, who edited Mr. Mason's notes on the food of birds, has endeavoured to sum up the results obtained. These conclusions will be mentioned later, but let us take, at random, a few common Indian birds and see what Mr. Mason was able to discover about their food.

It was found that the birds common at Pusa were for the most part beneficial. As regards the common Crows of India (*Corvus splendens splendens* and *Corvus coronoides levaillanti*) there are two opinions: Mason thought that the Crows could not be definitely classed as beneficial, and required if anything to have their numbers kept within certain limits, as is the case with *C. frugilegus* in England; but Maxwell-Lefroy was of opinion that Crows need protection, because of the fact that at Pusa the birds feed on *Chrotogonus*, a most destructive surface grasshopper. It is a moot point whether the Crows are beneficial to agriculture or not,

for these birds are notoriously omnivorous feeders as everyone knows. It is possible that in other parts of India Crows are injurious to crops. I do not think that if a Crow was given the choice between garbage and grain or an insect injurious to crops, the bird would eat the insect or the grain! The King-Crow or Black Drongo (*Dicrurus macrocercus macrocercus*) is regarded as a most useful bird, so much so that the erection of suitable perches is recommended as a measure to encourage the birds. This species is said to be of great importance in paddy fields. A curious fact is mentioned about the Starlings, which include the Mynas. The Common Myna (*Acridotheres tristis tristis*) is considered a bird well worthy of encouragement. Maxwell-Lefroy thinks that it could perhaps be encouraged by planting figs as avenue trees wherever possible. The trees would afford food and shelter and would help to maintain a number of birds which would assist in coping with an outbreak of crop-pests. The good done by Mynas, on account of the food they eat, is said to far outweigh every other consideration. On the other hand, the Rosy Pastor (*Pastor roseus*), although it is also a Myna, is nothing else but a pest and a bird most injurious to agriculture. The Indian Bee-eater (*Merops orientalis orientalis*) is another species about which a strange fact has been brought to light in view of the experiments carried out at Pusa. On the whole this species is regarded as beneficial, but it is a great nuisance to the apiarist. The Blue-tailed Bee-eater (*M. superciliosus javanicus*) is said to be distinctly injurious to agriculture. The greatest scourge of the farmer in India is the Green Paroquet. Maxwell-Lefroy says: "The Paroquets are deserving of no protection at all but of utter extermination, and all the nonsense written about their extermination by ignorant people in England is based on an entire ignorance of India. There is no more destructive bird to the crops than the paroquet and the cultivator is powerless against it." As regards the common House-Sparrow (*Passer domesticus*

indicus) opinions differ, but Maxwell-Lefroy ranks it as distinctly injurious. Of fruit-eating birds, the Indian Green Barbet (*Thereiceryx zeylanicus caniceps*) was found to be a general fruit pest in the orchards at Pusa, but Doves and Pigeons are said to be of little economic importance. Among the Storks, Ibises, Herons, etc., the Black Ibis (*Inocotis papillosus papillosus*) is ranked as a doubtfully injurious species, the Cattle-Egret (*Bubulcus ibis coromandus*) as a beneficial bird worthy of protection, the Pond-Heron (*Ardeola grayii*) as injurious because it feeds largely on dragon-flies, and the Egrets proper of doubtful importance to agriculture.

These few remarks sufficiently indicate the complexity of the problems which this branch of the study of bird-life presents. We must not forget that "in the study of economic ornithology it is essential to know practically everything about the bird with which we are dealing."

(*To be continued*)

S. BASIL EDWARDES

Basil-Edwardes, S. (1925) Ornithology in India. III. The Calcutta Review 15:47-52.

ORNITHOLOGY IN INDIA

III

Maxwell-Lefroy's conclusions, based on Mason's work on the food of birds in India, are given below :

"(1) In agricultural tracts the birds play an indispensable part in the protection of crops from insects.

(2) The following have an injurious action :—
Rose-ringed Paroquets and other Paroquets.
The Cranes
The Herons.
The House-Sparrow.
The Common Indian Green Barbet.
The Bee-Eaters.

(3) The following deserve protection, being markedly beneficial :—
The Indian Roller.
The Ortolan [The Rufous Short-toed Lark (*Calandrella brachydactyla dukhunensis*) is probably meant].
Crows (?)
The King-Crow.
Mynas.
The Hoopoe.
The Spotted Owlet.
Kites.
The Black Partridge.
The Cattle-Egret.

(4) Legislation to protect birds or to prohibit export of plumage needs to discriminate between beneficial and other birds.

(5) Tree-planting on roadsides is probably the most important direct way of encouraging beneficial birds, especially if preference is given to wild fig trees and other trees, affording food and shelter to the birds feeding both on fruits and on insects."

There is another large and important section of birds in India which is beneficial to man; but the value of these birds to mankind is of quite a different nature to that of birds which

are considered beneficial from an economic point of view. I refer to those birds which are beneficial to us from the sanitary aspect—to the scavengers.

In this category the Vultures stand first, assisted by Crows and Kites. Besides Vultures, Kites and Crows, there are perhaps other birds in some parts of India which can be ranked as scavengers; but in Simla, at any rate, a bird which plays some part in scavenging is the Steppe Eagle (*Aquila nipalensis nipalensis*). This Eagle is a visitor to Simla in the cold season, and during the time it remains in Simla it may always be seen near municipal incinerators, in company with Vultures and Crows. Another bird which used to be an important scavenger in certain parts of the country is the Adjutant Stork (*Leptoptilus dubius*). Many years ago Calcutta used to swarm with Adjutants. They were regarded as valuable scavengers, and, I understand, a fine was imposed on anyone who killed an Adjutant. Blanford says: "In Calcutta throughout the hot season and the rains Adjutants swarm, and formerly, before the sanitary arrangements of the city were improved, numbers haunted the river ghats in the day time and perched on Government House and other conspicuous buildings at night." Adjutants were undoubtedly very common years ago, but none are to be seen in Calcutta now. As far back as 1905, when Mr. Frank Finn was in the Indian Museum, the Adjutants seemed to have abandoned the city. This is probably due to the improved sanitary arrangements and the increased population and expansion of Calcutta.

It is an indisputable fact that Vultures are useful scavengers. In large towns and cities a great deal of garbage must accumulate, and it is essential that in such places where the population is large, the town or city should be as free from garbage as possible. It is the Vultures that help considerably in disposing of much foul matter. A few years back, all the refuse of Calcutta used to be dumped down at a place called Dhappa, which, of course, was the stronghold of the Vultures.

Writing of Bombay, EHA says: "Of all the unsalaried public servants who have identified themselves with this city and devoted their energies to its welfare, no other can take a place beside the vulture." Not only is the Vulture of use in cities; out in the fields the bird is just as useful. It is a common sight to find a crowd of Vultures round the carcase of a horse or cow lying in the country. Far removed from human habitation and the amenities of a city life, the poor villager's dead horse or cow cannot be disposed of by municipal authorities—the Vultures do the work. In a hot, tropical climate disease would be rife if the carcases of dead animals and other offensive matter were allowed to decompose all round us. The commonest vultures which take part in disposing of carcases are the White-backed Vulture (*Pseudogyps bengalensis*), the Indian Long-billed Vulture (*Gyps indicus indicus*), and the Black or Pondicherry Vulture, also known as the King Vulture (*Torgos calvus*).

Although these Vultures are of use in devouring carcases, we have in India a genus of Scavenger Vultures, a name which is somewhat misleading, as it implies that other Vultures are not scavengers. The fact of the matter is that Scavenger Vultures scavenge in a different way to their other vulturine relatives. There are two species in India, but the common bird is the Smaller White Scavenger Vulture (*Neophron percnopterus ginginianus*). This species is found in most parts of India, except in the extreme North-West and in Lower Bengal. It is not a Calcutta bird for instance, but it is common enough at Delhi. This disgusting bird haunts towns and villages, and although it eats carrion, it feeds to a large extent on human and animal excrement.

It will have been deduced from the pages that have gone before that although we have a fair knowledge of Indian ornithology there is still much to be learnt about the avifauna of India. We may come to know our birds in many ways. To mention three methods by which the furtherance of bird-

study in India may be attained. Firstly, by the field-worker and observer of Nature, who sees and hears birds in their natural haunts; secondly, by the aviculturist, who watches the life-history of his captive birds; thirdly, by the cabinet ornithologist working at home or in a large museum, who is able to study skins and classify birds in some scientific and methodical manner.

As I have endeavoured to indicate before, ornithology can well be studied by the private individual who is not a scientific man holding a Government appointment as such in a Zoo or Museum. Hume was not a professional scientist, nor was Hodgson, nor Oates, nor is Stuart Baker. A large number of our best ornithologists in India at the present day are men who have taken up the study of birds as a hobby. A large percentage of these men are in the Forest or Survey Department, in the Opium Department, in the Police or the Educational Services, in the Indian Civil Service, or in the Army. My paper has already attained a great length and it is, therefore, only possible to mention a few names, without even outlining the work done by these ornithologists. The following is a list of the names (arranged alphabetically) of some of our modern ornithologists in this country who have advanced our knowledge of the subject to a greater or lesser extent:

Dodsworth, P.T.L.; Donald, C.H.; Harington, Col. H.; Inglis, C.M.; Jones, A.E.; Kinnear, N.B.; Mackenzie, J. M.D.; Magrath, Col. H.; Osmaston, A.E.; Osmaston, B.B.; Primrose, A.E.; Ticehurst, C.; Whistler, H.; and Whitehead, C.H.T.

I cannot help quoting the following passage by Hume from the Preface to Volume I of *Stray Feathers*. This passage I have always called "Hume's Exhortation to Indian Ornithologists!" It runs as follows:

"A man has only to collect *steadily*, in almost *any* locality for a year or eighteen months, one or two specimens of *every* species he can come

across in his neighbourhood, to note, so far as practicable, in regard to each, whether they are rare or common, whether they are permanent residents or seasonal visitants, and if the latter, when they arrive and when they leave; whether they breed in his neighbourhood, and if so, when; what their nests are like, how many eggs they lay, and what these are like, and what their dimensions are; what the nestlings and young birds are like; what localities and what food the birds affect, and, even if he does all this *very*, very imperfectly in regard to a vast number of species, he will still (after his birds have been identified) possess materials for a most *useful* and *instructive* local avifauna, such as the most critical professed ornithologist will welcome cordially."

However, there are many who will not agree with Hume, as they deprecate the killing of harmless and beautiful birds, even for the cause of science. But we can study birds without killing them or robbing their eggs. Due to the great advancement of photography we are now able to collect a series of bird-pictures from actual life. In Europe bird-photography is much in vogue and there are many who have developed this pastime into a fine art, notably Messrs. Richard Cherry Kearton, the famous naturalists. Besides single bird-photographs we can secure a cinematograph film of birds in Nature—a moving-picture which takes us to the haunts of the bird and gives us the pleasure and benefit of watching its movements and behaviour as if the bird itself was before our eyes. In India hardly anyone[1] has taken seriously to bird-photography. So here is an untouched mine which holds rich stores, and a serious, useful, and at the same time, pleasurable hobby.

Charles Kingsley, the famous novelist, had a taste for Natural History which found expression in *Glaucus, or the Wonders of the Shore*, *the Water Babies*, and other works, but he was a great lover of birds. One of the best essays I have read is Kingsley's "A Charm of Birds," which was first

[1] Mr. E. H. N. Gill of the Opium Department, United Provinces, and Major R. S. P. Bates are the only persons known to me.

published in *Fraser's Magazine* in June, 1867.[1] It is a fascinating study of English bird-life, and yet a violent attack on those who know not Nature. Kingsley's words hold good to-day! "May and June are spent by most educated people anywhere rather than among birds and flowers" * * * "As for the song of birds, of which in the middle age no poet could say enough, our modern poets seem to be forgetting that birds ever sing." In this present world of rush and scurry there is no time for nature-study, no time to watch the engaging habits of our feathered friends. Are we losing "that love for spring which among our forefathers rose almost to worship?" Dame Nature is not the anchor of our purest thoughts, nor our nurse, nor guide, nor the guardian of our hearts.

"*Those first affections,*
Those shadowy recollections,
Which, be they what they may,
Are yet the fountain light of all our day,
Are yet the master light of all our seeing;
Uphold us, cherish, and have power to make
Our noisy years seem moments in the being
Of the eternal silence; truths that wake
To perish never;
Which neither listlessness, nor mad endeavour,
Nor man nor boy,
Nor all that is at enmity with joy
Can utterly abolish or destroy.
* * * * *
Then sing, ye birds, sing out with joyous sound."

S. BASIL-EDWARDES

[1] Reproduced in *Modern English Essays*, 1870-1920, Vol. I, pp. 62-82.